

6-6 Analyzing Graphs of Quadratic Functions

Vertex Form

$$y = a(x-h)^2 + k$$

Vertex (h, k)

a.o.s. $x = h$ 

Write the equation in vertex form.

ex $V(\frac{-b}{2a}, \quad)$

$$y = x^2 - 6x + 11$$

$$x - 11 = x^2 - 6x + 9$$

$$y - 2 = (x - 3)^2$$

$$y = (x - 3)^2 + 2 \quad V(3, 2)$$

$$x = 3$$

Graph it!

h translates the graph horizontally

k translates the graph vertically

a controls the direction and opening

wide/narrow

Write the equation in vertex form

ex

$$y = 3x^2 + 2x$$

$$y = 3(x^2 + \frac{2}{3}x + \frac{1}{9})$$

 $+\frac{1}{3}$ Really adding $\frac{1}{3}$ to both sides!

$$y + \frac{1}{3} = 3(x + \frac{1}{3})^2$$

$$y = 3(x + \frac{1}{3})^2 - \frac{1}{3}$$

$$V(-\frac{1}{3}, -\frac{1}{3})$$

Write the equation in vertex form.

ex

$$y = -2x^2 + 20x - 35$$

$$y + 35 = -2x^2 + 20x$$

$$y + 35 = -2(x^2 - 10x + 25)$$

$$y - 15$$

$$V(5, 15) \quad y = -2(x - 5)^2 + 15$$

Write the equation in vertex form.

ex

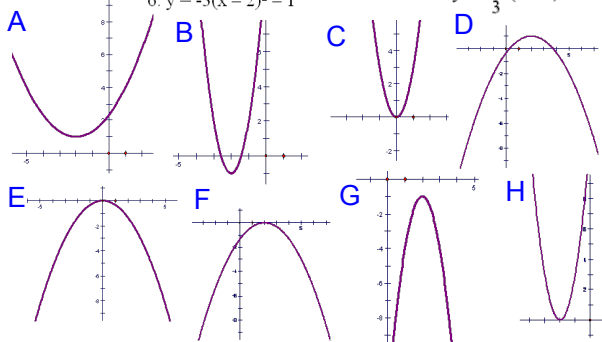
$$y = 4x^2 + 2$$

$$V(0, 2)$$

Matching

$$1. y = 3x^2 \quad 2. y = -\frac{1}{3}x^2 \quad 3. y = 3(x+2)^2 \quad 4. y = 3(x+2)^2 - 1$$

$$5. y = \frac{1}{3}(x+2)^2 + 1 \quad 6. y = -3(x-2)^2 - 1 \quad 7. y = -\frac{1}{3}(x-2)^2 \quad 8. y = \frac{-1}{3}(x-2)^2 + 1$$



Game

HW
p326
15-31 odd

Write each quadratic function in vertex form, if not already in that form. Then identify the vertex, axis of symmetry, and direction of opening.

$$15. y = -2(x+3)^2$$

$$17. y = 5x^2 - 6$$

$$19. y = -x^2 - 4x + 8$$

$$21. y = -3x^2 + 12x$$

$$23. y = 4x^2 + 8x - 3$$

$$25. y = 3x^2 + 3x - 1$$

Graph each function.

$$27. y = 4(x+3)^2 + 1$$

$$29. y = \frac{1}{4}(x-2)^2 + 4$$

$$31. y = x^2 + 6x + 2$$